ASPI | Afarand Scholarly Publishing Institute; Turkey
ISSN: 2345-2897; Health Education and Health Promotion. 2023;11(3):357-363. 10.58209/hehp.11.3.357

Effect of Educational Intervention Based on the Social Cognitive Theory on Reducing Internet Addiction in Medical Students

ARTICLE INFO

Article Type
Original Research

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How to cite this article
Abedini S, Hassani L, Daneshvar S, Ghanbarnejad A, Sayadi A. Effect of Educational Intervention Based on the Social Cognitive Theory on Reducing Internet Addiction in Medical Students. Health Education and Health Promotion. 2023;11-(3):357- 363.

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Article History
Received: June 9, 2023
Accepted: August 2, 2023
ePublished: August 28, 2023

ABSTRACT

Aims Research shows that students are one of the groups at risk of Internet addiction, and it seems necessary to control their psychological and social well-being affected by Internet addiction. The expansion of various job, educational, and communication dimensions of the Internet makes clear the necessity of using this tool in different groups, especially students; therefore, this study was conducted to determine the effectiveness of an educational intervention based on social cognitive theory on reducing Internet addiction in medical students of Bandar Abbas.

Materials & Methods This semi-experimental intervention study was conducted on 201 students of Banda Abbas University of Medical Sciences in 2020. Initially, students answered a researcher-made social cognitive theory (SCT) questionnaire and Young's Internet Addiction Inventory (IAT). Then, they were placed in two intervention and control groups with the same distribution. The intervention group received educational content for six weeks to reduce Internet addiction. Two months later, two groups completed the questionnaires again, and the data were analyzed with SPSS 16 software with covariance analysis and logistic regression.

Findings Statistically significant differences were observed between the two groups in knowledge (F=7.138; p=0.008), outcome expectation (F=7.881; p=0.006), outcome expectancies (F=8.697; p=0.004), self-efficacy to overcome obstacles (F=6.294; p=0.013), self-regulation (F=5.680; p=0.018) and emotional adjustment (F=8.664; p=0.004).

Conclusion Educational intervention based on the social cognitive theory affects knowledge, outcome expectations, outcome expectancies, self-efficacy to overcome impediments, self-control, and emotional coping of Internet addiction.

Keywords Internet Addiction Disorder; Social Cognitive Theory; Medical Students

CITATION LINKS

[1] Effect of technology addiction on academic ... [2] Assessment the rate of Internet addiction ... [3] Internet addiction among University Student ... [4] Assessing the effect of blended educational ... [5] The role of social skills & emotional intelligence in predicting internet ... [6] Evaluation of internet addiction and its related ... [7] The relationship of internet addiction with ... [8] The effect of mindfulness and wisdom as intervention ... [9] Prevalence and associated factors ... [10] Structural relations of rumination and ... [11] The prevalence of internet addiction and its associated ... [12] Prevalence and psychological intervention ... [13] Mexican and Spanish university students' Internet ... [14] Health behavior: Theory, research, and ... [15] Theoretical foundations of ... [16] Assessing the effect of an educational intervention program based on Health ... [17] Internet addiction status and its relation ... [18] The relationship between general health ... [19] Prevalence of Internet addiction and comparison ... [20] Knowledge, attitude, and self-efficacy regarding internet ... [21] Effects of social cognitive enhancement with family involvement ... [22] Self-care behaviors in patients with type 2 diabetes: Education ... [23] Talk to your doctors online: ... [24] Examining the effectiveness of a web-based ... [25] Application of the health action process approach ... [26] Effect of educational intervention based on Social ... [27] The application of social cognitive theory on mothers' ... [28] Application of social cognitive theory on maternal nutritional ... [29] Effects of a prevention program for internet addiction ... [30] The effectiveness of group counselling with cognitive restructuring and ... [31] The effectiveness of group cognitive-behavioral ... [32] The efficacy of social cognitive theory-based self-care ... [33] The current status of psychological intervention ... [34] Prevention of Internet ... [35] A behavior change model for internet ...

Introduction

In today's world, using the Internet and devices with smart technologies has made it possible to perform many online activities such as banking operations, accessing library information resources, playing games, watching movies, and receiving educational files full-time at any time and place [1, 2]. The growth and expansion of the Internet are undeniable for life in today's world and the development of various scientific, cultural, economic, and social sectors. However, the gap between this technology and the culture of its use is like a double-edged sword [3, 4]. Despite the many benefits of using this technology, it also has serious harmful consequences, serious concerns, and crises of social and behavioral science experts [5, 6].

Internet addiction is one of these behavioral disorders resulting from using technology [6, 7]. The term Internet addiction was first proposed by Goldberg in 1995, who called it a maladaptive pattern of Internet use that causes significant damage and disturbance. Then this concept was expanded by Yang in 1996 [5, 8]. Internet addiction is when a person uses the Internet excessively, regardless of the time of Internet use and the resulting consequences on various aspects of family, professional, and social life [1, 2, 8]. This behavioral disorder is a result of psychological injuries and can be the cause of their occurrence [5].

A wide range of behaviors related to Internet addiction include; Playing online games, watching movies and listening to music online, pornography, online gambling, and communication in social networks [9]. Internet addiction is considered a subset of behavioral addictions because it carries some signs and symptoms similar to drug addiction [4]. As in the studies of Memeshli *et al.* and Hashemi *et al.*, they show that a group of psychiatric symptoms, such as anxiety, stress, and depression, are associated with Internet addiction [10]. Also, psychologically, these people suffer from depression, stress and anxiety, loneliness, insecurity, isolation, mental fatigue, and despair [2, 10].

Internet addiction is more studied and investigated in developed and developing countries, such that a study conducted by Mitchell on the behavior of using the Internet in 6 Asian countries showed a prevalence of 14 to 51 percent of Internet addiction in them [9]. This prevalence is 6% worldwide, 7.1% in Asia, and 10.9% in the Middle East. It is also estimated to be 13% and 11% in the Iranian women and men population, respectively [2, 8]. In a study conducted by Yarahmadi *et al*. on the population of Iranian adults in 2020, the prevalence of Internet addiction was estimated at 57.6%, and the highest prevalence was observed in the age group below 35 years [11].

Among the factors that cause Internet addiction, we can mention the amount of quick and easy access, the connection location, finding peace in the virtual space, the skill of using the Internet, and the hours of its use.

Research shows that students are one of the groups at risk of Internet addiction [2]. A study by Sharma *et al.* in 2014 showed that Internet addiction is more common in students of higher education levels than other students and recommended educational interventions to reduce this disorder [12]. Theory-based educational interventions are considered one of the most effective and essential tools for preventing and controlling Internet addiction [4]. Bandura's social cognitive theory, which is considered one of the interpersonal theories of health education and health promotion, goes beyond the cognitive factors affecting behavior and also refers to the levels of environmental factors, skills, and behaviors, which provides a useful framework to explain why people adopt and maintain health behaviors [13, 14]. This model consists of 9 constructs: knowledge, outcome expectations, outcome expectancies, self-efficacy, self-efficacy to overcome impediments, situational perception, environment, self-control, and emotional coping [15].

Considering the development of communication and the variety of factors affecting people's behavior, the necessity of multi-faceted investigation of behaviors and educational interventions related to them, especially in socially influential groups such as students, is felt more than ever. Since the growth of educational and communication tools has been strongly associated with access to the Internet and has made the potential more susceptible to Internet addiction, the present study was conducted to determine the effect of educational intervention based on social cognitive theory on reducing internet addiction in students of Bandar Abbas University of Medical Sciences.

Materials and Methods

This was a semi-experimental study with pre-test/post-test method in Bandar Abbas University of Medical Sciences students in 2020. The volume of the studied sample using the statistical formula assuming an error of 5%, the power of the test is 80%, and d=1.2; the sample size was calculated from the Cochran formula of 98 people in each group. To prevent possible dropout, 20% was added to the above sample size, and the final sample size was determined to be 118 people in each intervention and control group. To determine the sample size, the study of Mahri and colleagues was used [16].

The first tool was Kimberly Young's Internet Addiction Standard Questionnaire containing 20 questions, the score of which showed a person's Internet addiction degree. Based on this questionnaire, scores between 20 and 49 indicate no internet addiction, 50 to 79 are the borderline of internet addiction, and people with scores above 80 and in the range of 80 to 100 are considered internet

addicts. According to Bahri *et al.*, the validity and reliability of this questionnaire have been reported in past studies with Cronbach's alpha of 0.9 [17]. Also, the reliability of its Persian version with Cronbach's alpha of 0.81 and 0.88 has been reported in the studies of Nastizai [18] and Ghassemzadeh [19], respectively. The reliability of the above tool in the current questionnaire was 0.91.

The second data collection tool was a researcher's questionnaire based on SCT containing 48 questions in 9 knowledge constructs, outcome expectations, outcome expectancies, situational perception, environment, self-efficacy, self-efficacy to overcome impediments, self-control, and emotional coping. Answers to knowledge questions were determined as three options: "True", "False" and "I don't know". The "correct" option was given a score of 1, and each of the "I don't know" and "wrong" options was given a score of zero. The answers to other constructs of the social cognitive theory were arranged based on a 5-point Likert scale, including "strongly agree", "agree", "no opinion", "disagree," and "strongly disagree". The questionnaire initially contained 60 questions. After designing the questions, the researcher was given to 10 experts in health and psychology education to determine the content and form validity of the questionnaire, which reached 48 questions after determining the validity and making the necessary corrections. The questionnaire was given to 35 students studying in different fields and degrees to determine the reliability. Finally, the tool's reliability was calculated with Cronbach's alpha coefficient, 0.81. Also, the checklist containing demographic information, including the variables of age, sex, field of study, level of education, and marital status, was completed by the people.

An available sampling method was used to collect data. First, the link to Young's Internet Addiction Questionnaire was sent online to all students through WhatsApp, Telegram, and SMS panel. After collecting data from 337 questionnaires, the received scores were calculated. Then, people who wanted to participate in the second phase of the study, according to Young's classification, were divided into two intervention groups (98 people) and control (103 people), and the SCT questionnaire was given to both intervention and control groups. People's answers were collected in this stage. Using statistical analysis, the predictive structures of Internet addiction were determined, including outcome expectancies, self-efficacy, self-efficacy to overcome impediments, and self-control. According to predictive structures, Relevant educational content such as posters (Photographs), short texts, educational text files, and educational videos with the approach of reducing Internet addiction among students were produced and sent to the participants of the intervention group at regular intervals for six weeks and simultaneously No content was sent to the control group until the end of the study. After that, SCT and Young's Internet Addiction Questionnaire were given to people in both groups. The educational content was provided to the control group students in a zip file after the research.

Using SPSS 16 software, one-way covariance analysis and logistic regression were used to analyze the data. A significance level of 0.05 was considered for all statistical tests used.

Findings

In total, 201 students entered the educational intervention stage. The number of female participants was 130 (64.7%), and the number of male participants was 71 (35.3%), aged 18 to 42 years. According to the grouping defined by Yang, who placed people with a score higher than 80 in the addicted group in terms of Internet addiction, and considering that only four people in this study had a score higher than 80, Therefore, to analyze the data better, all people at risk (Score 50 to 79) of Internet addiction and addicted people in terms of Internet addiction (Score higher than 80) were classified as "high risk" group.

Single people were in the high-risk group by 7.9% more than married people. Also, men were addicted to the Internet more than women. Undergraduate students, with 32%, were the most high-risk group. Most people in the high-risk group were in the paramedical faculty (38.2%; Table 1).

Table 1) Description of the demographic variables of the study participants

Parameter	Risky group		Healthy group		Sum
	Number	Percent	Number	Percent	
Gender					
Female	39	30	91	70	130
Male	23	32.3	48	67/6	71
Marital status					
Single	55	31.9	117	68.1	172
Married	7	24.1	22	75.9	29
Educational level					
Masters	33	32	70	68	103
general practitioner	24	29	58	71	82
Graduate	5	33.3	10	66.7	15
Faculty					
Paramedicine	13	38.2	21	61.8	34
Medicine	27	30.6	61	69.4	88
Nursing	8	26.6	22	73.4	30
Health school	14	28.5	35	71.5	49

After adjusting and carrying out the educational intervention, knowledge (F=7.138; p=0.008), outcome expectation (F=7.881; p=0.006), outcome expectancies (F=8.697; p=0.004), self-efficacy to overcome obstacles (F=6.294; p=0.013), self-regulation (F=5.680; p=0.018) and emotional adjustment (F=8.664; p=0.004) showed a significant difference between the intervention and control groups. Meanwhile, the effect of educational intervention on situational perception (F=0.625; p=0.430), environment (F=2.012; p=0.158), self-efficacy (F=1.751; p=0.187), and internet addiction (F=0.255; p=0.614) was insignificant.

Discussion

Considering the expansion of the use of Internet-based media among students to operationalize educational and research goals and the potential of these contexts in causing people to suffer from disorders related to the excessive use of these platforms, the upcoming study aims to determine the effect of the intervention education based on social cognitive theory has been conducted on reducing internet addiction among students at risk of internet addiction in Bandar Abbas university of medical sciences.

The results of the present study showed that the educational intervention caused a significant difference in knowledge between the intervention and control groups. In a study conducted by Laolam *et al.* using cognitive enhancement with family involvement (SCEFI) to prevent game addiction in middle school boys in Thailand, it became clear that the educational intervention based on social cognitive theory has caused a significant increase in the knowledge structure [21]. Also, according to Qureshi *et al.*'s research, an educational intervention based on social cognitive theory on performing self-care behaviors in patients with type 2 diabetes created a significant difference in the score of the knowledge construct [22]. The effectiveness of educational interventions through the structure of knowledge in these studies and their alignment with the current research results seems to be able to raise knowledge as one of the factors influencing behavior.

Regarding the outcome expectations score regarding Internet use, the findings showed that a statistically significant difference was observed between the two intervention and control groups after the educational intervention. Jiang's study, which was conducted on 758 people over 40 years of age in China to measure the effect of an educational intervention based on social cognitive theory on online patient-provider communication (OPPC), showed that there was no statistically significant difference in the outcome expectations, before and after the educational intervention [23]. Also, a study by Moeini *et al.*, who conducted an educational intervention based on social cognitive theory on the web for the effectiveness of adolescent girls' depression, did not observe any significant difference in their outcome expectations scores before and after the intervention, which is contrary to the result of the present study [24]. The discrepancy between the results of the aforementioned studies and the present study can be caused by the difference in the studied samples, in the study by Jiang *et al.*, people over 40 years old were included in the study, while the present study was conducted on students aged 18 to 42 years; also, in the study of Moeini *et al.*, only girls were examined, while the present study included both genders. The difference in the studied subjects can also be considered another factor in the obtained result.

This study showed a significant difference between the intervention and control groups in relation to the outcome expectancies. Teng *et al*., who conducted a study with the aim of reducing excessive Internet use behaviors among adolescents in rural schools in China, based on social cognitive theory, concluded that this intervention was effective on students' outcome expectancies [25], which is consistent with the current study in terms of results. Vesali Monfared *et al.*, who conducted research based on social cognitive theory with the aim of improving the preventive behaviors of cutaneous leishmaniasis in patients who were referred to Qom health centers, showed no significant difference in the outcome expectancies after the educational intervention, which is contrary to the result of the present study [26]. So, according to the results of other studies, it seems that it is not possible to judge with certainty the effectiveness of the intervention through the outcome value structure because it seems that despite the use of a single theory in behavior change, the difference in the studied subjects can be considered as a factor to create a difference in the obtained results.

The present study's findings showed the educational intervention's lack of effect on creating a significant difference between the intervention and control groups regarding situational perception. Anjamshua *et al.*'s study, which aimed to apply social cognitive theory to the nutritional behaviors of patients visiting Kerman health centers, had inconsistent results with the present study, in which the structure of situational perception showed a significant difference [27]. In the educational intervention based on social cognitive theory that was conducted in the study of Aghdasi *et al*., which was conducted on the nutritional behavior of mothers of children aged 6 to 12 months with developmental disorders in Mashhad, the understanding of a situation after the educational intervention showed a significant difference [28]. Considering the difference between the results of this study and other studies, it can be argued that the difference in research subjects using social cognitive theory can be a factor in creating different results in studies.

The present study determined that the educational intervention did not significantly differ the environment structure between the intervention and control groups. However, in the research of Anjamshua *et al.*, who benefited from the educational intervention based on social cognitive theory in improving the nutritional behaviors of those who refer to Kerman health care centers, the environment showed a statistically significant difference [27].

The findings of this study determined that despite the significant increase in the average self-efficacy score in the intervention group, the educational intervention did not create a significant difference between the intervention and control groups.

Yang *et al.*'s research showed that the educational intervention based on SCT in Korean students showed a significant relationship in the comparison between the intervention and control group [29]. Among the reasons for the difference between Yang's research and the present study, we can mention the specific use of the self-efficacy questionnaire and the 10-week intervention. Self-efficacy was conducted as one of the constructs of the present study under a 6-week intervention. Mahri *et al.*'s study did not show a significant relationship between self-efficacy and Internet addiction, which was in line with the current research [20].

In the present study, the result of the educational intervention on the self-efficacy structure of overcoming impediments caused a significant statistical difference in the intervention and control groups. Fadil et al.'s research showed that group counseling with cognitive restructuring and self-management techniques effectively reduces students' addiction to the Internet. These findings claim that students who received group counseling with cognitive restructuring and self-management techniques experienced a reduction in internet addiction [30]. The results of this research were consistent with the data obtained from the current study.

The results of this study showed that the educational intervention caused a significant increase in the average self-regulation score in the intervention group and created a significant difference between the intervention and control groups. Mohammadi Zaidi *et al.*'s three-month intervention showed a significant increase in self-management towards internet use in medical students of Qazvin [31], Which was consistent with the previous study regarding the statistically significant difference in the self-regulation structure of Bandura's social cognitive theory in the intervention group after the educational intervention program. In a study by Yang *et al*., self-control increased significantly after the educational intervention based on social cognitive theory in Korean students. It showed a significant relationship in the comparison between the intervention and control group [29]. The alignment of the above research findings shows that perhaps the self-regulation structure can be considered one of the factors influencing behavior change.

The findings showed that the educational intervention on emotional coping created a significant difference between the intervention and control groups. Qureshi *et al.*'s study, which was conducted on self-care behaviors in diabetics, showed that an educational intervention based on social cognitive theory has significantly increased the emotional coping of these patients, which was in line with the results of the previous study [22]. Mohebi *et al.*'s research, which was conducted on the correct use of antibiotics on outpatients referring to Tehran medical centers based on social cognitive theory, showed that the educational intervention has made a significant change in the emotional adaptation structure of this theory, which shows the compatibility of this finding with the result of the present study [32]. It seems that in other studies, the educational intervention based on this theory has been able to have an effect on this structure.

The findings of the educational intervention determined that despite the increase in the average score of Internet addiction in the intervention group, no statistically significant difference was observed between the two intervention and control groups. Several studies showed that theory-based interventions can reduce students' Internet addiction scores [33-35]. Also, Yang *et al.'*s study showed that an educational intervention based on social cognitive theory on middle school students in South Korea was effective in preventing internet addiction behaviors [29]. Perhaps it can be argued that among the reasons for the difference in this result with other studies, the difference in the time of the study (Occurrence of the present study during the COVID-19 pandemic), the difference in the age groups of the studied subjects, the difference in the duration of the intervention and the difference in the tools used.

The occurrence of the COVID-19 epidemic and conducting virtual educational interventions due to the impossibility of conducting face-to-face interventions, limiting access to research based on the theories and models with the aim of reducing Internet addiction, and the difficulty of encouraging students to participate in research due to lack of interest were the limitations of this study. It is suggested that researchers take advantage of the most appropriate theory or model of behavioral change according to the capacities and limitations of society and the study of their research. Since Internet addiction is a multifactorial issue, it is suggested that combined educational interventions (Face-to-face and virtual) be implemented to overcome this behavioral disorder. Also, considering the capacity of social cognitive theory to include interpersonal dimensions beyond individual dimensions, it seems useful for future studies. It seems useful to test the intervention in different age groups that are involved in such disorders.

Conclusion

Educational intervention based on the social cognitive theory affects knowledge, outcome expectations, outcome expectancies, self-efficacy to overcome impediments, self-control, and emotional coping of Internet addiction.

Acknowledgments: The author would like to thank all the participants for their sincere cooperation in the study.

Ethical Permission: This article is retrieved from the research project approved by Bandar Abas University of Medical Sciences with the Ethics committee reference number IR.HUMS.REC.1400.65.

Conflict of Interests: There is no conflict of interest in the study.

Authors' Contribution: Abedini S (First Author), Introduction Writer/Main Researcher/Discussion Writer (25%); Hassani L (Second Author), Methodologist/Main Researcher (20%); Daneshvar S (Third Author), Methodologist/Assistant Researcher (15%); Ghanbarnejad A (Fourth Author), Methodologist/Assistant Researcher (15%); Sayadi A (Fifth Author), Introduction Writer/Methodologist/Main Researcher/Discussion Writer/Statistical Analyst (25%)

Funding/Support: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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